

CLAIMS

1. A polypeptide in substantially isolated form which comprises a sequence selected from the sequences of Seq.ID.No: 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28 and 29, or a polypeptide substantially homologous thereto.

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2. A polypeptide in substantially isolated form which comprises a sequence selected from the sequences of Seq.ID.No: 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28 and 29.

3. A polypeptide which comprises a fragment of a polypeptide defined in claim 1 or 2, said fragment comprising at least 12 amino acids and an epitope.

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A 4. A polynucleotide in substantially isolated form which encodes a polypeptide according to ~~any one of claims 1 to 3.~~ ^{Claim 1 or 2}

5. A polynucleotide in substantially isolated form which is capable of selectively hybridizing to Seq.ID.No: 3 or 4 or a fragment thereof.

6. A polynucleotide fragment according to claim 5 which comprises a sequence selected from the sequences of Seq.ID.No: 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25 and 27, or a polynucleotide at least 90% homologous thereto.

7. A polynucleotide in substantially isolated form comprising a sequence selected from the sequences of Seq.ID.No: 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25 and 27.

8. A polynucleotide probe which comprises a fragment of at least 15 nucleotides of a polynucleotide as defined in ~~any one of claims 4 to 7~~, ^{Claim 4} optionally carrying a revealing label.

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9. A recombinant vector carrying a polynucleotide as defined in ~~any one of claims 4 to 7.~~ ^{Claim 4}

10. An antibody capable of binding a polypeptide or fragment thereof as defined in ~~any one of claims 1 to 3.~~ ^{Claim 1 or 2}

11. An antibody capable of binding a polypeptide or fragment thereof wherein the polypeptide is a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or is a peptide substantially homologous thereto.

12. A test kit for detecting the presence or absence of a pathogenic mycobacterium in a sample which comprises a polynucleotide according to any one of claims 4 to 8, a polypeptide according to any one of claims 1 to 3, a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto, or an antibody according to, any one of claims 10 or 11.

13. A method of detecting the presence or absence of antibodies in an animal or human, against a pathogenic mycobacteria in a sample which comprises: ^{Claim 1 or 2}

(a) providing a polypeptide according to ~~any one of claims 1 to 3~~ or a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto, which comprises an epitope;

(b) incubating a biological sample with said polypeptide under conditions which allow for the formation of an antibody-antigen complex; and

(c) determining whether antibody-antigen complex comprising said polypeptide is formed.

14. A method of detecting the presence or absence of a polypeptide according to ~~any one of claims 1 to 3~~ or a polypeptide which comprises a sequence selected from the

sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto in a biological sample which method which comprises:

- (a) providing an antibody according to any one of claims 10 and 11;
- (b) incubating a biological sample with said antibody under conditions which allow for the formation of an antibody-antigen complex; and
- (c) determining whether antibody-antigen complex comprising said antibody is formed.

15. A method of detecting the presence or absence of cell mediated immune reactivity in an animal or human, to a polypeptide according to claims 1 to 3 or a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto, which method comprises

- (a) providing a polypeptide according to any one of claims 1 to 3 or a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto, which comprises an epitope;
- (b) incubating a cell sample with said polypeptide under conditions which allow for a cellular immune response such as release of cytokines or other mediator or reaction to occur; and
- (c) detecting the presence of said cytokine or mediator or cellular response in the incubate.

16. A pharmaceutical composition comprising a polypeptide according to ^{claim 1 or 2} ~~any one of claims 1 to 3~~ in a suitable carrier or diluent.

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17. A composition according to claim 16 or a composition comprising a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto,

for use in the treatment or prevention of diseases caused by mycobacteria.

A 18. A method of treating or preventing mycobacterial disease in an animal or human caused by mycobacteria which express a polypeptide according to ^{claim 1 or 2} ~~claims 1 to 3~~ or a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto, which method comprises vaccinating or treating an animal or human with an effective amount of said polypeptide.

~~19. A method of treating or preventing mycobacterial diseases in animals or humans caused by mycobacteria containing the polynucleotide of Seq.ID.No: 3 or 4, which method comprises vaccinating or treating an animal or human with an effective amount of a polynucleotide according to claims 4 to 7, a vector according to claim 9 or a polynucleotide which encodes a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto.~~

A 20. A method according to ^{claim 18} ~~claims 18 or 19~~ for increasing the in vivo susceptibility of mycobacteria to antimicrobial drugs.

A 21. A normally pathogenic mycobacterium, whose pathogenicity is mediated in all or in part by the presence or the expression of a polypeptide as defined in ^{claim 1 or 2} ~~any one of claims 1 to 3~~ or a polypeptide which comprises a sequence selected from the sequences of Seq.ID.No: 31, 33, 35, 37 and 39 or a polypeptide substantially homologous thereto, which mycobacterium harbours an attenuating mutation in a gene encoding one of the said polypeptides.

22. A vaccine comprising a mycobacterium as claimed in claim 21.

23. A vaccine according to claim 22 wherein the mycobacteria is selected from *Mav*s, *Mptb* and *Mtb*.

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